

1        1. A molecular complex which comprises:  
2              a template having a plurality of ionic functional groups; and  
3              a conducting polymer selected from the group consisting of polypyrrole,  
4              polythiophene or poly(phenylene sulfide) and substituted versions thereof having  
5              charges thereon which bind to the organic functional group, the complex having a  
6              polypyrrole ratio of between about 0.5 to 4.5.

1        2. The complex of claim 1 wherein the template is selected from the group  
2              consisting essentially of chiral polymers and polyelectrolytes.

1        3. The complex of claim 2 wherein the polyelectrolytes are selected from the  
2              group consisting essentially of poly(styrene sulfonic acid), poly(acrylic acid), poly(vinyl  
3              methyl ether-co-maleic acid), poly(methacrylate acid), poly(2-acrylamido-2-methyl-1-  
4              propene sulfonic) acid, poly(butadiene-maleic acid), poly(phenylene vinylene) and salts  
5              and co-polymers thereof.

1        4. The molecular complex of claim 1 wherein the conducting polymer is  
2              selected from the group consisting essentially of poly(acrylic acid) or poly(vinyl methyl  
3              ether-co-maleic acid, and the conducting polymer is polypyrrole.

1        5. A method for the formation of a molecular complex comprising a template  
2              having a plurality of ionic functional groups and a conducting polymer having charges  
3              thereon which comprises:  
4              forming a monomer template adduct in a pH range of between about 2 to 7; and

5            polymerizing the monomer to form the conducting polymer, the conducting  
6        polymer ratio being between about 0.5 to 4.5.

7            6.        The complex of claim 5 wherein the template is selected from the group  
8        consisting essentially of chiral polymers and polyelectrolytes.

1            7.        The complex of claim 6 wherein the polyelectrolytes are selected from the  
2        group consisting essentially of poly(styrene sulfonic acid), poly(acrylic acid), poly(vinyl  
3        methyl ether-co-maleic acid), poly(methacrylate acid), poly(2-acrylamido-2-methyl-1-  
4        propene sulfonic) acid, poly(butadiene-maleic acid), poly(phenylene vinylene) and salts  
5        and co-polymers thereof.

1            8.        The molecular complex of claim 5 wherein the conducting polymer is  
2        selected from the group consisting essentially of poly(acrylic acid) or poly(vinyl methyl  
3        ether-co-maleic acid, and the conducting polymer is polypyrrole.